

**Claims**

1. Force sensor (1) including a support (2) of two arms carrying an longitudinal electromechanical element (3), which electric properties are changeable by a mechanical deformation ( $\Delta x$ ) due to a force (F);  
5 characterised in that the electromechanical element is a nanostructure (3).
2. Force sensor (1) according to claim 1;  
10 characterised in that the changeable electric property is the conductance.
3. Force sensor (1) according to claim 1 or 2;  
characterised in that  
15 the support (2) is U-shaped.
4. Force sensor (1) according to anyone of the claims 1 to 3;  
characterised in that  
20 each arm (2) is provided with a cusp (5), on which the nanostructure (3) is mounted.
5. Force sensor (1) according to anyone of the claims 1 to 4;  
25 characterised in that an actuator is provided in order to transmit an external source to the nanostructure (3).
6. Force sensor (1) according to anyone of the claims 1 to 4;  
30 characterised in that a movable mass (7, m) provided with a tip (11) is arranged between the arms (4), where the mass (7) is movable due to an acting acceleration (a) and due to the resulting force (F)  
35 the tip (11) acts on the nanostructure (3).

7. Force sensor (1) according to anyone of the claims 1  
to 6;  
characterised in that  
a second nanostructure (10) is carried by the arms (4) in  
5 order to compensate environmental effects.

8. Force sensor (1) according to claim 7;  
characterised in that  
each arm (2) is provided with a further cusp (5), on which  
10 the second nanostructure (10) is mounted.

9. Force sensor (1) according to claim 8;  
characterised in that  
each arm (2) is provided with an insulation (9) in order to  
15 electrically separate the nanostructure (3, 10).

10. Force sensor (1) according to anyone of the claims 7  
to 9;  
characterised in that  
20 the second nanostructure (10) is either a nanotube or a  
carbon nanotube or a quasi one-dimensional nanostructure.

11. Force sensor (1) according to anyone of the claims 1  
to 10;  
25 characterised in that  
the nanostructure (3) is either a nanotube or a carbon  
nanotube or bor-nitride nanotubes or a quasi one-dimensional  
(1D) nanostructure.

[Received by the International Bureau on 31 May 2005 (31.05.2005);  
original claims 1-11 replaced by amended claims 1-10 (2 pages)]

### Claims

1. Force sensor (1) including a support (2) of two arms  
carrying an longitudinal electromechanical element (3), which  
electric properties are changeable by a mechanical deforma-  
5 tion ( $\Delta x$ ) due to a force (F);  
characterised in that  
the electromechanical element is a nanostructure (3) and an  
actuator is provided in order to transmit a force (F) to the  
nanostructure (3).

10

2. Force sensor (1) according to claim 1;  
characterised in that  
the nanostructure (3) is either a nanotube or a carbon nano-  
tube or bor-nitride nanotubes or a quasi one-dimensional (1D)  
15 nanostructure.

3. Force sensor (1) according to claim 1 or 2;  
characterised in that  
the changeable electric property is the conductance.

20

4. Force sensor (1) according to anyone of the claims 1 to  
3;  
characterised in that  
the support (2) is U-shaped.

25

5. Force sensor (1) according to anyone of the claims 1 to  
4;  
characterised in that  
each arm (2) is provided with a cusp (5), on which the nano-  
30 structure (3) is mounted.

6. Force sensor (1) according to anyone of the claims 1 to 5;

characterised in that

5 a movable mass (7, m) provided with a tip (11) is arranged between the arms (4), where the mass (7) is movable due to an acting acceleration (a) and due to the resulting force (F) the tip (11) acts on the nanostructure (3).

10 7. Force sensor (1) according to anyone of the claims 1 to 6;

characterised in that

a second nanostructure (10) is carried by the arms (4) in order to compensate environmental effects.

15 8. Force sensor (1) according to claim 7;

characterised in that

each arm (2) is provided with a further cusp (5), on which the second nanostructure (10) is mounted.

20 9. Force sensor (1) according to claim 8;

characterised in that

each arm (2) is provided with an insulation (9) in order to electrically separate the nanostructure (3, 10).

25 10. Force sensor (1) according to anyone of the claims 7 to 9;

characterised in that

the second nanostructure (10) is either a nanotube or a carbon nanotube or a quasi one-dimensional nanostructure.

30

**Statement under PCT Article 19(1)**

According to the findings in the search report and the written opinion dated march 18<sup>th</sup> 2005 a new formulated set of claims 1 to 10 is filed. These amended claims 1 to 10 replace the originally filed claims 1 to 11.

There is no need to adopt the description or the drawings to the amended claims 1 to 10.

Zürich, 30.05.2005



Hansjörg Kley  
Agent  
AV 47543